

THURSDAY, JANUARY 4, 1906.

## BRITISH PROGRESS IN ENGINEERING.

*National Engineering and Trade Lectures.* Edited by Ben H. Morgan. Vol. i., *British Progress in Municipal Engineering.* By W. H. Maxwell. Pp. 182. Price 6s. net. Vol. ii., *British Progress in Pumps and Pumping Engines.* By P. R. Björöling. Pp. xii+92. Price 6s. net. Vol. iii., *British Progress in Gas Works' Plant and Machinery.* By C. E. Brackenbury, A.M.I.C.E. Pp. xii+105. Price 6s. net (London: Archibald Constable and Co., Ltd., 1905.)

THESE lectures, as they are termed, are stated to be "a project to stimulate and expand British trade in colonial and foreign markets," and their "primary object is to show colonial and foreign buyers what progress Great Britain has made up to the present time in the manufacture of all classes of machinery and goods. Each lecture will emphasise novel points of design and utility, and up-to-date methods of manufacture; and these points will be graphically illustrated by reproductions of photographs and drawings." They are, accordingly, evidently designed to have an advertising and business character, instead of the educational and instructive objects which are generally associated with lectures. Engineering is assigned the first place in the British industries to be dealt with; and the three volumes enumerated above are the first ones published of the engineering series, eleven more of which are stated to be in preparation by experts in the different branches.

The first of these books, relating to municipal engineering, is definitely divided into three lectures, the first commencing with an introductory review of the progress of sanitary science and the work of large British municipalities, and then proceeding to deal with road engineering and maintenance; the second lecture treats of sewerage and main drainage, and sewage and refuse disposal; and the third is devoted to water supply.

Each lecture contains more printed matter than could possibly be read within the usual allotted period of one hour, not allowing for any references to illustrations; whilst, on the other hand, the space given to these lectures is far too limited to enable these very important subjects, with their wide range, to be dealt with except in a very cursory manner. The aim, however, it must be remembered, of these so-called lectures is not to explain the principles and describe the practice of various branches of engineering, but to indicate to persons in the colonies and abroad, by the aid of illustrations and brief descriptions in some cases, what are considered the best materials and the newest and most useful types of machines for carrying out works in these different branches, and the names of the manufacturers in Great Britain who supply them. For this purpose, in addition to the names of manufacturers and companies, appended in many cases to references to municipal works, plant, and materials, in the text, and to the illustrations, a

list is supplied at the end of each lecture of the various makers of the plant, machinery, tools, and materials used in the municipal works which it describes, occupying altogether forty-eight pages. A short appendix, also, at the end of the book, gives a very useful list of the literature bearing on municipal engineering, to assist persons desiring fuller information on the subjects referred to.

These lectures are well illustrated by 196 very clear figures and views, consisting of photographic reproductions and drawings, mostly in full-page plates, with a few folding ones; and a fairly full synopsis of each lecture, together with a list of the illustrations at the commencement of the book, is considered to serve the purpose of an index. Valuable particulars about certain important municipal works will be found here and there in the book; but, whereas the two succeeding volumes, on pumps and gas works, are fairly well suited for the business objects of these lectures, owing to their appertaining so closely to mechanical engineering, the scientific, biological, and civil engineering aspects of municipal works have had to be, to a large extent, sacrificed to the main purpose of these publications.

In the second volume of this series, a brief introduction indicates the importance of pumping and hydraulic machinery, and the main points that should be considered in the selection of pumps under different conditions; and the author then proceeds to describe, with the aid of illustrations, the principal types of pumps and pumping engines made by the chief British firms, pointing out the special features to be borne in mind in buying them, and the particular sort of work for which each form of pump is best adapted. Eight distinct classes of pumps are described in separate sections, namely, pumps worked by hand, pumps driven by water-power and wind-power, gas and oil engine, hot-air, and compressed air-pumps, electrically-driven pumps, and steam-pressure pumps; and the different forms of pumps in each class are given with the names of their makers, together with allusions to their merits in special cases, and any deficiencies in respect to certain conditions of work. Electricity is being rapidly extended as a motive power for pumps, especially for underground working in collieries and mines, and where the power has to be transmitted to a considerable distance; and the construction of directly-driven centrifugal pumps, pumps driven by single, double, and treble gearing, and by belt, the "Riedler" pump, and the sinking pump, is briefly explained. The descriptions of steam pumps occupy half the book, dealt with successively under the four types of direct-acting, rotative, pulsating, and rope- and belt-driven pumps. The book is illustrated by ninety-seven views and drawings of pumps, and at the end, after a short list of books on pumps and pumping-engines published in Great Britain, a directory of British manufacturers of these machines is given occupying twenty-one pages. As in the first volume, the table of contents and an unpaginated list of plates are the only index provided in this and the succeeding volume; and the illustrated reference to the English De Laval centrifugal pumps

must have been added as an afterthought, as these pumps do not appear in the table of contents or in the list of plates. This volume should prove valuable in guiding persons requiring pumping machinery, both in the choice of the pump best suited to their requirements, and as to the firms from whom they can be purchased.

The third volume deals with the machinery employed in the various processes involved in the manufacture of coal-gas, such as the handling of coal, retorts, stoking, the removal of coke, condensers, exhausters, washer-scrubbers, purifiers, gasholders, and various gas appliances, with the names of the principal makers; but some of the subjects are referred to in a very cursory manner, two pages only being given, for instance, to water-gas plant, and also to the very important economic question of bye-products. The descriptions are illustrated by one hundred and thirteen views of plant and machinery; and following the principle adopted in the earlier volumes, a classified list of British gas-engineering literature is added at the end of the book, and also of British manufacturers of gasworks' plant and machinery, occupying respectively eleven and twenty-eight pages, amounting to two-fifths of the text of the book. The author holds very optimistic views as to the future of the gas industry, which he considers are borne out by the remarkable success of the recent Gas Exhibition at Earl's Court, and which, in spite of frequent gloomy prophecies of the injurious influence on it of the development of electric lighting, has more than doubled itself in the last twenty years.

Everything has been done on the publishers' part to render these volumes attractive, by very well reproduced illustrations, unusually large and wide-spaced print, good paper, neat binding, and a moderate price; and they may reasonably be expected to be very useful, from a commercial point of view, in making the scope and efficiency of British manufactures and machinery more fully known in the colonies and foreign countries, and thereby extending the range of British trade and engineering.

#### A STANDARD ATLAS OF ENGLAND AND WALES.

*The Survey Atlas of England and Wales. A Series of 84 Plates of Maps and Plans, with Descriptive Text, illustrating the Topography, Physiography, Geology, Climate, and the Political and Commercial Features of the Country.* Designed by and prepared under the direction of J. G. Bartholomew. (The Edinburgh Geographical Institute, 1903.) Price 2½ guineas.

THIS sumptuous volume, which began to be issued in parts in 1903, is a credit to all concerned with its publication. Mr. Bartholomew and the Royal Geographical Society are to be congratulated on adding a work of great beauty as well as of scientific merit to the resources of all who have to study England and Wales. These are a majority of the thoughtful members of the community, for "know thy country" is a maxim next in importance in the

modern world to "know thyself." A work which concentrates in one volume the materials for a close study of its surface anatomy and human settlements and routes, as well as a general survey of its resources and activities, is a precious possession, which will increase in value as years pass, for it is the most condensed, yet clear and precise, summary of certain aspects of the material condition of England and Wales at the beginning of the twentieth century which the future historian will find within reasonable compass. What would present historians not give for similar records of the England of past centuries?

The present work may be divided into four parts:—(1) general geographical maps; (2) detailed topographical maps; (3) town plans; and (4) text and tables.

(1) The general maps are more complete than in any other atlas, although most of them have been published previously in another form. The first plate, the oro-bathymetrical map, is a new one, and contains names for the outstanding features of the land which may be regarded as at least semi-official. They were selected by Dr. Mill and Messrs. Chisholm and Mackinder at the request of the Royal Geographical Society. It is convenient to have such a set of names, and undoubtedly the greater number, even of those which are new or have had an extended significance given to them, will be generally accepted. There are, however, one or two exceptions. The term gap, which has been familiarised to us in recent years, more particularly in American writings, can hardly be applied to the broad lowland between Wales and the Pennines, though it may be used for the valleys of the Tyne and Aire, which afford narrow but easy routes across the Pennines. Norfolk Edge and East Anglian Ridge are other terms which seem to imply more pronounced topographical features than they represent. The Vale of Pickering seems unduly extended into that of York. We fail to discover any very clear rule as to what features should and should not be named. We find the Vale of York, but not the Vale of Trent or Severn; the Vale of Taunton, but not of Pewsey. While it is a pity that something more systematic and complete has not been attempted, some of the names are distinctly happy and will remain.

The geological map is unfortunately on a smaller scale than that in the companion "Atlas of Scotland," and hardly shows sufficient detail unless for the country south of London, which is shown on an inset. A smaller scale map illustrates the distribution of old, young, and coal-bearing rocks and iron centres. It is clear, but coal and iron are shown in greater detail on a map of mineral products which comes later. Maps of vegetation, lands in pasture or in crops, afford material for a long chapter in geography and economics. The next two sheets show maps of monthly and annual rainfall and temperature, driest and wettest months, the annual range of temperature, and the annual temperature not reduced for altitude. The subsequent two sheets depict the railways in black, the spheres of influence of the various companies being shown by different tints. We welcome